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Fraser, C.M.

Hydroids from Vancouver Island
and Nova Scotia.

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HYDROIDS FROM VANCOUVER ISLAND AND
NOVA SCOTIA. ZOOLOGY,
CAMBRIDGE, MASS.

BY

C. McLEAN FRASER

(From Bulletin No. 1, Victoria Memorial Museum, October 23, 1913.)

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BULLETIN No. 1

XV.—*Hydroids from Vancouver Island.*

By C. McLEAN FRASER.

This report on the Vancouver Island Hydroids contains nothing essentially new, with the exception of some references to material collected in 1910 by Mr. W. Spreadborough in the neighbourhood of the Queen Charlotte islands. The basis for the report is the material already worked up for the paper on "The Hydroids of the west coast of North America", published in May 1911, as a Bulletin from the laboratories of natural history of the State University of Iowa.

The purpose of the report is simply to put in one list all the species that have been collected from the coasts of Vancouver island and to give, where possible, some notes as to their habitat, etc., that may be useful to anyone collecting hydroids in these waters. No one realizes more fully than the writer does, that this list represents but very poorly the hydroid fauna of the district, but everything must have a beginning, and what has been done already will form a basis for future work.

Judging from the luxuriance of the specimens obtained from the west coast of the island and on northward to the Queen Charlotte islands, I am firmly convinced that some systematic dredging would bring to light a hydroid fauna which would equal in richness that of any other coast. Nor is it necessary to stop at Queen Charlotte islands, as the work that has been done off the coast of Alaska gives an indication of how rich the fauna is in that region. Between Vancouver island and the mainland at all points are conditions quite different from those

on the open coast, but in many cases no less suitable for many forms of marine life. The islands are so numerous that there is a great extent of shore line with all varieties of exposed and sheltered, bluff headlands and sloping beaches. Best of all are the areas in the larger straits and bays at the termini of the narrow channels where the tide-rip brings such an abundance of food supply for all sorts of marine forms. To give one illustration: in Northumberland strait at a point about 5 miles southeast of Nanaimo, Dodds narrows enters it from the west, while Gabriola island forms a boundary to the east. At low slack tide Dodds narrows seems a rather insignificant passage, but when the tide turns and rushes through it must be a powerful boat that can make headway against it. In a small area in the strait at or near the mouth of the narrows, over 20 species of hydroids were obtained in a couple of hours' dredging. Such situations abound in the Gulf of Georgia.

The work has only been started but it promises well. If at some time in the near future the Department of Fisheries could see its way clear to equip and man a boat to do such work as the "Albatross" and the "Fishhawk" have been doing and are doing for the U.S. Bureau of Fisheries, there need be no lack of opportunity for doing good work. If such were carried out, it would not be long before the number of species of hydroids reported would be many times the present number.

The collections that have been reported on are as follows: (1) Some shore forms collected by the writer at the Minnesota Seaside Station, in the summer of 1903. (2) Material collected by Rev. G. W. Taylor, on a trip to Queen Charlotte islands and other points to the north of Vancouver island, previous to 1908. (3) Collections made at Departure bay in 1908 and 1909. These consisted of shore forms near the laboratory on the mainland, and on the various islands near by, of forms dredged right in the bay between the station and the outer islands and some dredged farther out, outside of Newcastle island and over towards Gabriola island. (4) Collections made chiefly by dredging in Northumberland strait, at the entrance to Dodds narrows and reported in the West Coast paper as from Dodds narrows. (5) Some shore material collected by Mr. John Macoun at Victoria in 1908. (6) Collections made by Dr. A.

G. Huntsman and by Messrs. Macoun, Spreadborough, and Young off Amphitrite point near Ucluelet in 1909. (7) Material collected off Queen Charlotte islands by Mr. Spreadborough in 1910.

In giving the names of the species I have made no attempt at giving synonymy, but instead have referred to the page in the paper on the West Coast Hydroids where the synonymy may be obtained.

VANCOUVER ISLAND HYDROIDS.

ENDOCRYPTA HUNTSMANI Fraser.—(p. 19). The generic name *Crypta* was at first used for this species, but later it was found that the name was preoccupied in both the Mollusca and the Coleoptera and notice of the change was published in Science Vol. XXXV, No. 893. Feb. 9, 1912, p. 216.

It would be of interest to investigate further the life history of this species. Its habitat, so far as I am aware, is entirely unique. The location in which it is found seems a very suitable one for obtaining a food supply, while the fact that so many colonies were found would indicate that their presence was not a matter of accident. If one could only find out how much of the life cycle was passed within the branchial basket of the ascidian it might give an indication of the way in which these colonies are implanted without being injured in any way by the ascidian. I knew nothing about the species until within a few days of my departure, hence though I got a good many colonies they were almost all obtained in the one day, and were all within a comparatively narrow range of development.

The ascidians containing the specimens were all obtained by dredging in the shallow water near the station, principally between Brandon island and the mainland and seldom in more than 7 or 8 fathoms of water.

SYNCORYNE MIRABILIS (Agassiz).—(p. 21). This species has not been reported from Canadian waters from the west coast unless Agassiz' reference from the Gulf of Georgia applies. In the material collected by Mr. Spreadborough at Queen Charlotte islands there were numerous specimens growing on *Garveia annulata*.

GARVEIA ANNULATA Nutting.—(p. 22). Some small specimens were obtained at Port Renfrew. They were growing on a sponge attached to the surface of overhanging rock just below extreme low water. Those collected at Ucluelet were growing on a sponge also. Mr. Spreadborough obtained some excellent specimens, much larger than the others, at Queen Charlotte islands.

PERIGONIMUS REPENS (Wright).—(p. 24). Only a few specimens were obtained growing on small gastropod shells in the deep waters of Departure bay in about 15 or 20 fathoms.

EUDENDRIUM CALIFORNICUM Torrey.—(p. 24). Some specimens were found at Port Renfrew, attached to the rocks at low tide. Those obtained at Ucluelet were finer specimens.

HYDRACTINIA AGGREGATA Fraser.—(p. 25). The gastropod shells on which these specimens were found, were dredged near the rocky ledge in front of the laboratory, in from 5 to 8 fathoms.

HYDRACTINIA MILLERI Torrey.—(p. 27). Fairly common at Port Renfrew; found growing over colonies of encrusting bryozoa. These masses can be chipped off readily bringing the colonies of *Hydractinia* with them.

TUBULARIA CROCEA (Agassiz).—(p. 27). Some specimens growing on a piece of stick were obtained in some material collected by Mr. Taylor at Port Simpson.

TUBULARIA HARRIMANI Nutting.—(p. 28). One lot of fine specimens was obtained at Port Renfrew.

CAMPANULARIA DENTICULATA Clark.—(p. 29). Somewhat common on the laminaria growing in the shallow water to the east of the station.

CAMPANULARIA EXIGUA (Sars).—(p. 30). A few specimens were found growing on *Garveia annulata*, in the Ucluelet material.

CAMPANULARIA GRÆNLANDICA Levinsen.—(p. 31). As previously stated, but one specimen was found, this growing on *Lafæa gracillima* at Port Renfrew.

CAMPANULARIA KINCAIDA Nutting.—(p. 31). There was but one representative of the species, from Dodds narrows. In this case as in the previous one the individual specimen was in such good condition that there was no difficulty with the diagnosis.

CAMPANULARIA RARIDENTATA Alder.—(p. 32.) Specimens from Departure bay and from material obtained by Mr. Taylor, from the Queen Charlotte islands, were found growing on fucus holdfasts.

CAMPANULARIA URCEOLATA Clark.—(p. 33). Apparently very abundant at Queen Charlotte islands, as, in the material collected by Mr. Taylor as well as that collected by Mr. Spreadborough, the colonies growing over other hydroids were numerous. It was quite plentiful in the Dodds Narrows material, growing on *Abietinaria filicula* and at Port Renfrew on *Eudendrium californicum*.

CAMPANULARIA VERTICILLATA (Linnæus).—(p. 33). The best specimens were obtained by Mr. Taylor from Queen Charlotte islands; those from Dodds narrows were badly broken up and there were not many of them.

CAMPANULARIA VOLUBILIS (Linnæus).—(p. 34). Rather scarce in both Banks Island and Ucluelet material.

CLYTIA EDWARDSI (Nutting).—(p. 34). Abundant, growing on the laminaria in shallow water east of the station in the bay.

EUCOPELLA EVERTA (Clark).—(p. 37). At Port Renfrew this species was growing on a small stalked ascidian and in Departure bay on laminaria in company with *Sertularella turgida*.

GONOTHYRÆA CLARKI (Marktanner-Turneretscher).—(p. 37). This species and *Clytia edwardsi* are the commonest of the Campanularian species in the Departure Bay neighbourhood. This does not signify that they are found together. *Clytia edwardsi* is found almost entirely on laminaria within the bay; *Gonothyræa clarki* is found growing on the smaller algæ in tide pools in more exposed locations, e. g. on the outlying rocks at the east and the west of the entrance of Hammond bay.

OBELIA BOREALIS Nutting.—(p. 38). Plentiful in the Ucluelet material.

OBELIA DICHOTOMA (Linnæus).—(p. 38). Not very plentiful in Departure bay. Specimens obtained from Newcastle island.

OBELIA DUBIA Nutting.—(p. 38). Not common though found in small quantities at Ucluelet, Dodds narrows, Departure bay, and later at Queen Charlotte islands.

OBELIA GRIFFINI Calkins.—(p. 39.) But one colony found at Departure bay.

OBELIA LONGISSIMA (Pallas).—(p. 39). A few specimens from Departure bay, some from Dodds narrows in poor condition and some from the material from Banks island.

OBELIA PLICATA Hincks.—(p. 39). Not common, but a few good specimens were obtained by dredging near the rocky ledge in the bay.

CALYCELLA PYGMÆA Alder.—(p. 41). Common in Departure bay and Dodds narrows.

CALYCELLA SYRINGA (Linnaeus).—(p. 42). Plentiful in the material from Banks and Queen Charlotte islands.

In my former paper I discussed these two species at some length. Since that paper was written I have had the opportunity of studying material from many localities along the Atlantic coast only to find that the same differences exist there as here. The difference in size seems to be rather definite, but it seems strange when so many specimens of the smaller form have been found that the gonosome has never appeared, while it is commonly found with the larger form. Until a gonosome is found with the smaller or until its life history is further worked out than it is at present, it is impossible to say whether or not it is a distinct species. For the present, on account of the difference in size, it seems better to retain the two specific names.

CUSPIDELLA HUMILIS (Alder).—(p. 44). Common on *Lafæa-gracillima* dredged outside of the main entrance to Departure bay, 25 fathoms.

LOVENELLA PRODUCTA (Sars).—(p. 44). Few specimens growing on serpulid tubes in material dredged in Dodds narrows.

HALECIUM ANNULATUM Torrey.—(p. 46.) Growing on algæ at Port Renfrew and Dodds narrows and on stalked ascidians at Ucluelet.

HALECIUM DENSUM Calkins.—(p. 47). Excellent specimens of this species were obtained from Port Renfrew at low tide, and from Ucluelet at a depth of 30 fathoms.

HALECIUM HALECINUM (Linnaeus).—(p. 47). A single colony dredged in 10 fathoms at Ucluelet.

HALECIUM WASHINGTONI Nutting.—(p. 50). A few specimens were dredged at Dodds narrows.

HALECIUM WILSONI Calkins.—(p. 49). Many fine specimens were dredged in Ships channel, Barkley sound, in 25 fathoms.,

GRAMMARIA IMMERSA Nutting.—(p. 51). A fine large specimen was obtained at Dodds narrows by dredging.

LAFŒA DUMOSA (Fleming).—(p. 51). Common everywhere from below low tide mark to the depth of the deepest dredgings made (about 30 fathoms). Found in materials from Banks island, Departure bay, Dodds narrows, Ucluelet and Port Renfrew.

LAFŒA GRACILLIMA (Alder).—(p. 52). Found as plentifully and under much the same conditions as the preceding, in all the localities mentioned except Banks island.

ABIETINARIA ABIETINA (Linnæus).—(p. 57). Common in dredged material but not a shore form. Found at Banks island, Departure bay, Dodds narrows, and Ucluelet.

ABIETINARIA AMPHORA Nutting.—(p. 58). Several fine specimens, loaded with gonophores, were obtained near low-tide at Ucluelet and Port Renfrew and one specimen was dredged at Dodds narrows.

ABIETINARIA ANGUINA (Trask).—(p. 58.) Found in shallow water at Port Renfrew and Ucluelet.

ABIETINARIA FILICULA (Ellis and Solander).—(p. 60). Some specimens were obtained by Mr. John Macoun along the shore at Beacon Hill Park, Victoria, and some were dredged at Dodds narrows.

ABIETINARIA GREENEI (Murray).—(p. 61). One of the very common species on the Vancouver Island coasts. It does not seem to thrive where the water is at all foul but where the water is clear it may be found growing in large clusters under overhanging rocks or in crevices often near the low tide mark but sometimes at a much greater depth. The finest specimens were obtained from Port Renfrew and Ucluelet, but others were found in Departure bay and Dodds narrows.

ABIETINARIA TRASKI (Torrey).—(p. 63). Somewhat common in dredged material in Departure bay and Dodds narrows. The stem is slender but rather rigid and the relatively short branches break off from the stem rather easily, hence it is not always a simple matter to get a perfect specimen.

ABIETINARIA VARIABILIS (Clark).—(p. 65). Obtained only from material collected from Queen Charlotte islands.

DIPHASIA CLARÆ Fraser.—(p. 64). Only a couple of specimens from Queen Charlotte islands.

HYDRALLMANIA DISTANS Nutting.—(p. 65). Common at Ucluelet in 9 fathoms and in Dodds narrows at the same or greater depth.

SELAGINOPSIS CYLINDRICA (Clark).—(p. 65). Found only in material collected off Queen Charlotte islands.

SELAGINOPSIS MIRABILIS (Verrill).—(p. 66). Specimens from material dredged in Northumberland strait, 20 fathoms.

SELAGINOPSIS PINNATA Mereschkowsky.—(p. 66). One fine colony was obtained from Queen Charlotte islands.

SERTULARELLA CONICA Allman.—(p. 68) Found in shallow water growing on small worm tubes at Ucluelet and Port Renfrew.

SERTULARELLA TRICUSPIDATA (Alder).—(p. 71). Common in the dredged material in Departure bay and Northumberland strait.

SERTULARELLA TURGIDA (Trask).—(p. 71). Most widely distributed Sertularian on the Vancouver Island coasts. It grows in the shallow water, even up to low tide mark, as well as in deep water. It was collected at Ucluelet, Port Renfrew, Victoria, Northumberland strait, and Departure bay. The short stiff colonies with the large hydrothecæ are readily recognized.

SERTULARIA FURCATA Trask.—(p. 72). Some especially fine colonies of this species were obtained by Mr. John Macoun at Ucluelet. They were growing on small nereocystis stems and in each case formed a complete coat for some inches along the stem.

THUIARIA ARGENTEA (Linnæus).—(p. 75). This was not previously reported but was found in the material collected off the Queen Charlotte islands by Mr. Spreadborough.

THUIARIA DALLI Nutting.—(p. 75). Common about Departure bay at low tide, especially at the northwest end of Newcastle island and on some of the smaller islands. It has been obtained as well from Northumberland strait and Ucluelet.

THUIARIA FABRICII (Levinsen).—(p. 76). Rare, found only in Northumberland strait.

THUIARIA SIMILIS (Clark).—(p. 77). Commonly dredged in Departure bay and Northumberland strait in 10-25 fathoms, but not so common here as in the San Juan archipelago.

THUIARIA THUJA (Linnæus).—(p. 78). Two specimens were obtained in material from Banks island.

AGLAOPHENIA STRUTHIONIDES (Murray).—(p. 80). Very common around the south end of the island from Victoria to Ucluelet but not observed north of Victoria on the east side of the island. The large clusters of long symmetrical plumes make this species one of the most conspicuous as well as the most beautiful of the hydroid forms in this region.

PLUMULARIA GOODEI Nutting.—(p. 82). A few specimens of this delicate little plumularian were found near low water at Port Renfrew.

PLUMULARIA LAGENIFERA Allman.—(p. 82). This is the commonest plumularian in the region, While *Aglaophenia struthionides* seems to have reached its northern limit near the southern end of the island, *Plumularia lagenifera* extends much farther north. Specimens were obtained by Mr. Taylor at Hope island and many specimens were obtained from Departure bay and Northumberland strait. Much the finest specimens were obtained from Ucluelet.

PLUMULARIA PALMERI Nutting.—(p. 84). A few specimens were obtained at Ucluelet.

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BULLETIN No. 1

XVI.—*Hydroids from Nova Scotia.*

By C. McLEAN FRASER.

The material for this report was collected in distant localities, at times some distance apart. Much of it was collected by the writer in the neighbourhood of Canso, the extreme eastern point of the mainland, in the summer of 1902, when the Marine Biological Laboratory was located temporarily at that place; the remainder was collected by Mr. John Macoun, in the neighbourhood of Barrington Passage at the extreme southern end of the peninsula, in the summer of 1910.

At Canso, the numerous old wharves and piles afford good collecting ground within the harbour. There are numerous islands in the vicinity, but as their shore line consists usually of hard smooth granite, comparatively few species are to be found. In Chedabucto bay, by dredging in from 20 to 50 fathoms of water many fine specimens were found, but the bottom is so rough and rocky that dredging is rather a slow process, and conditions are very similar near by in the open Atlantic. A good opportunity was afforded for getting some fine specimens from the Codbanks. Cod fishing was carried on in about 45 to 50 fathoms with the trawl lines. Very often the trawl hooks brought stalked ascidians or pieces of rock to which were attached specimens of hydroids. Taking everything into consideration, therefore, the conditions gave variety enough to obtain some interesting specimens.

At Barrington Passage, the specimens were obtained from shallow water to a depth of 5 fathoms.

Of the 50 species reported, two are new, viz., *Campanularia magnifica* and *Cryptolaria triserialis*. Three others, *Campanularia grænlandica*, *Lafæa symmetrica*, and *Halecium minutum* have not previously been reported from the east coast of North America.

My thanks are due to Professor Nutting for his assistance in this as well as other hydroid work I have done, and to my wife who has made the drawings.

SYSTEMATIC DISCUSSION.

No family or genus has been defined in this paper because, with the exception of the Genus *Cryptolaria*, they have been defined in my West Coast paper, and are here used with the same significance. With regard to the genus mentioned, there has been no disagreement among the authors who have used it. In the synonymy I have given the original reference for the species in each case, and besides this, when possible, some references to papers dealing with localities not very far distant. It is for that reason that Prof. Nutting's paper on the Woods Hole region appears so often, and also that of J. F. Whiteaves, although the latter gives no definitions and little synonymy.

Full descriptions of several of the species appear in two of my own papers that are still in manuscript, viz: "Some Beaufort Hydroids," being published by the U. S. Bureau of Fisheries, and "Some notes on New England Hydroids" being published in a Bulletin from the Laboratories of Natural History of the State University of Iowa.

CLAVIDÆ.

Genus CLAVA.

CLAVA LEPTOSTYLA Agassiz.

Clava leptostyla Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 218.

Clava leptostyla Verrill, Invert. An. of Vineyard sound, 1874, p. 328.

Clava leptostyla Nutting, Hydroids of Woods Hole, 1901, p. 321.

Clava leptostyla Whiteaves, Marine Invertebrates of Eastern Canada, 1901, p. 18.

On piles of the wharves and on stones, at or near low water, not very abundant. Canso.

BOUGAINVILLIDÆ.

Genus BOUGAINVILLIA.

BOUGAINVILLIA CAROLINENSIS (McCrady).

Hippocrene carolinensis McCrady, Gymn. of Charleston har., 1857, p. 62.

Margelis carolinensis Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 344.

Margelis carolinensis Verrill, Invert. An. of Vineyard sound, 1874, p. 733.

Bougainvillia carolinensis Nutting, Hydroids of Woods Hole, 1901, p. 330.

On rocks at low water, Grassy island, Canso. Not previously reported from Nova Scotia.

EUDENDRIDÆ.

Genus EUDENDRIUM.

EUDENDRIUM DISPAR Agassiz.

Eudendrium dispar Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 285.

Eudendrium dispar Nutting, Hydroids of Woods Hole, 1901, p. 332.

Eudendrium dispar Whiteaves, Marine Invert. of Eastern Canada, 1901, p. 20.

Collected by Mr. John Macoun, in 5 fathoms, Barrington Passage.

EUDENDRIUM RAMOSUM (Linnæus).

Tubularia ramosa Linnæus, Systema Naturæ, 1758, p. 804.

Eudendrium ramosum Hincks, British Hydroid Zoophytes, 1868, p. 82.

Eudendrium ramosum Nutting, Hydroids of Woods Hole, 1901, p. 332.

Eudendrium ramosum Whiteaves, Marine Invert. of Eastern Canada, 1901, p. 19.

One specimen on a Buccinum shell, dredged in 45 fathoms, Chedabucto bay, Canso.

EUDENDRIUM TENUE A. Agassiz.

Eudendrium tenue A. Agassiz, North American Acalephæ, 1865, p. 160.

Eudendrium tenue Nutting, Hydroids of Woods Hole, 1901, p. 333.

Eudendrium tenue Whiteaves, Marine Invert. Eastern Can., 1901, p. 20.

Plentiful on mussel shells, near low water in the harbour, Canso.

HYDRACTINIDÆ.

Genus HYDRACTINIA.

HYDRACTINIA ECHINATA (Fleming).

Alcyonium echinatum Fleming, British Animals, 1828, p. 517.

Hydractinia echinata Hincks, British Hydroid Zoophytes, 1868, p. 23.

Hydractinia polyclina Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 227.

Hydractinia polyclina Nutting, Hydroids of Woods Hole, 1901, p. 335.

Hydractinia echinata Whiteaves, Marine Invert. Eastern Can., 1901, p. 21.

Common on Littorina shells inhabited by hermit crabs and on small stones, at low water in the harbour, Canso.

CORYMORPHIDÆ.

Genus CORYMORPHA.

CORYMORPHA PENDULA Agassiz.

Corymorpha pendula Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 227.

Corymorpha pendula Nutting, Hydroids of Woods Hole, 1901, p. 337.

Monocaulis glacialis Whiteaves, Marine Invert. Eastern Can., 1901, p. 21.

Two specimens dredged from muddy bottom at a depth of 50 fathoms, in the Atlantic at the entrance to Chedabucto bay, Canso.

TUBULARIDÆ.

Genus TUBULARIA.

TUBULARIA CROCEA (Agassiz).

Parypha crocea Agassiz, Cont. Nat. Hist. U. S., Vol. IV, 1862, p. 249.

Parypha crocea Verrill, Invert. An. Vineyard sound, 1874, p. 390.

Tubularia crocea Nutting, Hydroids of Woods Hole, 1901, p. 340.

Plentiful on mussel shells attached to piles and on rocks in shallow water, in the harbour, Canso.

TUBULARIA LARYNX Ellis and Solander.

Tubularia larynx E. and S., Nat. Hist. of Zoophytes, 1786, p. 31.

Tubularia larynx Nutting, Hydroids of Woods Hole, 1901, p. 338.

Tubularia larynx Whiteaves, Marine Invert. Eastern Can., 1901, p. 20.

Collected at a depth of 4 fathoms, by Mr. John Macoun, Barrington Passage.

TUBULARIA TENELLA (Agassiz).

Thamnocnidia tenella Agassiz, Cont. Nat. Hist. U. S., 1862, p. 275.

Tubularia tenella Nutting, Hydroids of Woods Hole, 1901, p. 339.

Tubularia tenella Whiteaves, Marine Invert. Eastern Can., 1901, p. 20.

On mussel shells below low water mark, on exposed shores, Canso.

CAMPANULARIDÆ.

Genus CAMPANULARIA.

CAMPANULARIA AMPHORA (Agassiz).

Laomedea amphora Agassiz, Cont. Nat. Hist. U.S., IV, 1862, p. 311.

Campanularia amphora Nutting, Hydroids of Woods Hole, 1901, p. 347.

On mussel shells under Hart's wharf, and on rocky coast, Canso.

CAMPANULARIA FLEXUOSA (Hincks).

Laomedea flexuosa Hincks, Ann. and Mag. Nat. Hist., 3rd ser. VIII, 1861, p. 260.

Campanularia flexuosa Hincks, British Hydroid Zoophytes, 1868, p. 168.

Campanularia flexuosa Nutting, Hydroids of Woods Hole, 1901, p. 348.

Campanularia flexuosa Whiteaves, Marine Invert. Eastern Can., 1901, p. 22.

One of the most abundant hydroids on the coast, found growing everywhere at or near low water, on rocks, seaweeds, etc.

CAMPANULARIA GRÆNLANDICA Levinsen.

Campanularia grænlandica Levinsen, Meduser, Ctenophorer og Hydroider fra Grænlands Vestkyst, 1893, p. 26.

Several specimens of this fine species were found growing on *Sertularella tricuspidata* attached to the stalk of an ascidian, brought up by a trawl hook from a depth of 50 fathoms on the Canso Banks in the Atlantic, 7 or 8 miles east of Canso. This species has not been reported previously from the east coast of North America, south of Greenland.

CAMPANULARIA MAGNIFICA new species.

Plate XI, figs. 1-3.

Trophosome. Colonies consisting of solitary individuals growing from a stout stolon which is not annulated but may be slightly sinuous. The hydrothecæ are very large, as much as 2.5mm. in length and with greatest width about 0.8mm. They are nearly tubular with a tendency to be slightly urceolate. The margin is slightly flaring, is crenulated with 10 or 12 elevations and depressions. A series of parallel lines pass down vertically from the margin for about one-third the length of the hydrotheca. The pedicels vary much in length but never exceed twice the length of the hydrotheca. They are annulated throughout.

Gonosome. The gonangia are very large also. The male and female are similar in size and shape, somewhat longer than the hydrothecæ and also broader at the greatest diameter. The gonangium is supported on a very short pedicel, is almost oval in shape except that the distal end is drawn out into a long bottle-neck. The aperture is circular, occupying the whole of the distal end. A few corrugations, low and not very noticeable, are present on the broad proximal portion.

Distribution. Several specimens, in close company with *Halecium tenellum*, attached to a stalked ascidian, were brought up by a trawl hook from a depth of 50 fathoms on the Canso Banks.

The trophosome of this species bears a great resemblance to that of *Campanularia speciosa* Clark¹. Prof. Nutting had some of Clark's original specimens from Shumagin islands, Alaska, and by using those I was able to make a comparison of the two. The hydrotheca is more urceolate in *C. speciosa* than in *C. magnifica* and the stolon is distinctly annulated, but in other respects they are very similar; when the gonosome is present there is no difficulty as the obconical gonangium of *C. speciosa* bears little resemblance to the elongated gonangium of *C. magnifica*. I have made a drawing of *C. speciosa* from a Shumagin Island specimen, showing the hydrotheca and the gonangium to the same scale so that the two species may be compared (See Plate XI, fig. 4).

¹Clark, S. F. Alaskan Hydroids, 1876, p. 24.

CAMPANULARIA NEGLECTA (Alder).

Laomedea neglecta Alder, Cat. Zooph. Northumberland and Durham, 1857, p. 33.

Campanularia neglecta Nutting, Hydroids of Woods Hole, 1901, p. 346.

Growing on *Obelia commissuralis* under the wharves, Canso.

CAMPANULARIA VERTICILLATA (Linnæus).

Sertularia verticillata Linnæus, Systema Naturæ, 1758, p. 811.

Campanularia verticillata Nutting, Hydroids of Woods Hole, 1901, p. 347.

Campanularia verticillata Whiteaves, Marine Invert. Eastern Can., 1901, p. 22.

On rocks brought from a depth of 50 fathoms, east in the Atlantic and in Chedabucto bay, Canso.

CAMPANULARIA VOLUBILIS (Linnæus).

Sertularia volubilis Linnæus, Systema Naturæ, 1767, p. 1311.

Campanularia volubilis Verrill, Invert. An. Vineyard sound, 1874, p. 408.

Campanularia volubilis Nutting, Hydroids of Woods Hole, 1901, p. 345.

Campanularia volubilis Whiteaves, Marine Invert. Eastern Can., 1901, p. 22.

On bryozoan, collected by Mr. John Macoun in 5 fathoms, Barrington Passage; on stalked ascidians and on *Sertularella tricuspidata* growing on these stalks, in 50 fathoms, Canso Banks.

Genus CLYTIA.

CLYTIA JOHNSTONI (Alder).

Campanularia johnstoni Alder, Cat. Zooph. Northumb. and Durham, 1857, p. 36.

Clytia bicophora Agassiz, Cont. Nat. Hist. U.S., IV, 1862, p. 304.

Clytia bicophora Nutting, Hydroids of Woods Hole, 1901, p. 343.

Clytia johnstoni Whiteaves, Marine Invert. Eastern Can., 1901, p. 24.

In shallow water, Barrington Passage; abundant on mussel shells and on *Obelia commissuralis* under wharves and elsewhere near low water in the harbour, Canso.

Genus EUCOPELLA.

EUCOPELLA CALICULATA (Hincks).

Campanularia caliculata Hincks, Ann. and Mag. Nat. Hist., 2nd ser. XI, 1853, p. 178.

Clytia poterium Agassiz, Cont. Nat. Hist. U.S., IV, 1862, p. 297.

Campanularia poterium Nutting, Hydroids of Woods Hole, 1901, p. 344.

Campanularia caliculata Whiteaves, Marine Invert. Eastern Can., 1901, p. 23.

Rather common on seaweed at about 20 fathoms, off the islands between Chedabucto bay and the Atlantic, Canso.

Genus GONOTHYRÆA.

GONOTHYRÆA GRACILIS (Sars).

Laomedea gracilis Sars, Beretning om en zoologisk Reise i Lofoten og Finmarken, 1851, p. 18.

Gonothyræa gracilis Allman, Ann. and Mag. Nat. Hist., 3rd ser. XIII, 1864, p. 374.

Gonothyræa gracilis Verrill, Proc. Am. Assn. Adv. Sc., 1874, p. 364.

On tangle of *Tubularia crocea*, in shallow water, Canso; in shallow water, Barrington Passage.

GONOTHYRÆA LOVENI (Allman).

Laomedea loveni Allman, Ann. and Mag. Nat. Hist., 3rd ser. IV, 1859, p. 138.

Gonothyræa loveni Allman, Ann. and Mag., 3rd ser. XIII, 1864, p. 374.

Gonothyræa loveni Nutting, Hydroids of Woods Hole, 1901, p. 352.

On red algæ in 20 fathoms, Chedabucto bay, Canso.

Genus OBELIA.

OBELIA COMMISSURALIS McCrady.

Obelia commissuralis McCrady, Gymno. Charleston har., 1858, p. 95.

Obelia commissuralis Nutting, Hydroids of Woods Hole, 1901, p. 350.

Obelia commissuralis Whiteaves, Marine Invert. Eastern Can., 1901, p. 23.

The commonest campanularian of the region; on rocks, piles, seaweeds, etc., at or below low water, Canso.

OBELIA DICHOTOMA (Linnæus).

Sertularia dichotoma Linnæus, Systema Naturæ, 1758, p. 812.

Obelia dichotoma Nutting, Hydroids of Woods Hole, 1901, p. 350.

Obelia dichotoma Whiteaves, Marine Invert. Eastern Can., 1901, p. 23.

Common on Laminaria, at and below water, Canso.

OBELIA GENICULATA (Linnæus).

Plate XII, figs. 1 and 2.

Sertularia geniculata Linnæus, Systema Naturæ, 1767, p. 1312.

Obelia geniculata Nutting, Hydroids of Woods Hole, 1901, p. 350.

Obelia geniculata Whiteaves, Marine Invert. Eastern Can., 1901, p. 23.

In 3 fathoms, Barrington Passage; on laminaria and other seaweeds, on piles, etc., at low water, Canso.

Some abnormal specimens of this species were found growing on *Lemargus margilis*—a copepod, parasitic on a sunfish (*Mola mola*), caught in Chedabucto bay. In normal specimens, the hydrothecæ appear in regular alternation to give the regular geniculate appearance of the stem. The gonophores appear in the axils, being regularly disposed but not in any way affecting the geniculation of the stem. In this case the gonophores take the place of the hydrothecæ, making up a portion of the regular geniculate arrangement, and do not appear in the axils.

CAMPANULINIDÆ.

Genus CALYCELLA.

CALYCELLA SYRINGA (Linnæus).

Sertularia syringa Linnæus, Systema Naturæ, 1767, p. 1311.

Calycella syringa Nutting, Hydroids of Woods Hole, 1901, p. 355.

Calycella syringa Whiteaves, Marine Invert. Eastern Can., 1901, p. 23.

In shallow water, Barrington Passage; abundant on *Sertularella tricuspidata* from 50 fathoms, Canso Banks.

Genus OPERCULARELLA.

OPERCULARELLA LACERATA (Johnston).

Campanularia lacerata Johnston, British Zoophytes, 1847, p. 111.

Opercularella lacerata Nutting, Hydroids of Woods Hole, 1901, p. 354.

On the rocks at low tide, Fox island, Chedabucto bay, Canso.

HALECIDÆ.

Genus HALECIUM.

HALECIUM BEANI (Johnston).

Thoa beani Johnston, British Zoophytes, 1847, p. 120.

Halecium beani Nutting, Hydroids of Woods Hole, 1901, p. 358.

In 5 fathoms, Barrington Passage; in 50 fathoms, Canso Banks.

HALECIUM MINUTUM BROCH.

Plate XII, figs. 3, 4.

Halecium minutum Broch, Nordmeer gesammelten Hydroiden, 1903, p. 4.

On ascidian stalks from 50 fathoms, on the Canso Banks.

Since Broch first described this species there has been no further report of it where the diagnosis was certain. Broch,

himself, in his paper on Arctic Hydroids¹ mentions a species that he takes to be the same but he is not sure as he did not find the gonosome. Later Kramp² for the same reason could not be sure of the specimens he found. All of these specimens were found in the Arctic or Subarctic regions. There was not such trouble in the case of the specimens found at Canso as the gonophores were numerous. When they are present they are so large and conspicuous that they must be observed before the trophosome is. The trophosome bears so much resemblance to that of *H. tenellum* that they are hard to distinguish from each other. When the gonosome is present such a mistake could not be made as the gonangium of *H. minutum* may be as much as 3 mm. in long diameter and not far from that in short diameter. The thickness is not so great, so that altogether its shape somewhat resembles the shell of a bivalve. The arrangement of the teeth or spines around the margin at the distal end gives it a unique appearance among the gonangia of the Halecidae. The gonangium of *H. muricatum* most nearly resembles it, but is not more than one-fourth of the size and it is spiny on the flat surfaces as well as on the margin; while that of *H. minutum* has but few spines on the margin and none on the flat surfaces.

The figures show the relatively small stem and the very large gonangium.

HALECIUM MURICATUM (Ellis and Solander).

Sertularia muricatum E. and S., Nat. Hist. Zooph., 1786, p. 59.

Halecium muricatum HINCKS, British Hydroid Zoophytes, 1868, p. 223.

Halecium muricatum WHITEAVES, Marine Invert. Eastern Can., 1901, p. 25.

On ascidian stalks from 50 fathoms on the Canso Banks. A few specimens, well supplied with gonangia, were collected.

HALECIUM TENELLUM Hincks.

Halecium tenellum HINCKS, Ann. and Mag. Nat. Hist., 3rd ser. VIII, 1861, p. 252.

¹Die Hydroiden der Arktischen Meere, 1909, p. 153

²Report on the Hydroids of the Denmark Expedition, 1911, p. 370.

Halecium tenellum NUTTING, Hydroids of Woods Hole, 1901, p. 357.

Common on ascidian stems in 50 fathoms of the Canso Banks.

LAFCEIDÆ.

Genus CRYPTOLARIA.

CRYPTOLARIA TRISERIALIS new species.

Plate XIII, figs. 1 and 2.

Trophosome. Stem fascicled, very coarse. No complete colony was obtained. The largest fragment was 4 cm. long and 0.8 mm. in diameter. There were several large branches given off from the main stem. On the stem the hydrothecæ are not numerous; they appear singly or in opposite or sub-opposite pairs, each with about the distal half free. On the branches, where they are free from fasciculation, the hydrothecæ are nearer together, arranged in three series, two making such a wide angle with each other that they are not far from being in the same plane, and the other intermediate between them on the larger side. The hydrothecæ of the first two series appear in pairs, those of the other alternate with these pairs. They are large, from 1.5 to 2 mm. in length and 0.35 mm. in diameter. The proximal half is in contact with the branch, the distal half curves regularly outward.

Gonosome. Unknown.

Distribution. Dredged in 20 fathoms off Durell island, Chedabucto bay, Canso.

In some respects this species resembles *Cryptolaria borealis* Levinsen¹. His description is rather meagre, but as his colonies were only from 4.5 to 20 mm. long, the species must be a much smaller one than that herein described. On the non-fascicled branches, the hydrothecæ are arranged in four series, giving a cruciform arrangement, while in this species there are but three series. These differences alone seem sufficient to indicate that the Canso specimens are of a different species to those found in Davis strait.

¹Meduser, Ctenophorer og Hydroider fra Grønlands Vestkyst, 1893, p. 31.

Genus FILELLUM.

FILELLUM EXPANSUM Levinsen.

Filellum expansum LEVINSEN, Hydroider fra Grønlands Vestkyst, 1893, p. 30.

Common in shallow water, growing on other hydroids, Barrington Passage and Canso.

This species seems very common all the way down the coast as far as Beaufort, N.C. A description of the species containing an original description of the coppinia mass has been given in a paper, "Notes on New England Hydroids" mentioned in the introduction of this paper.

FILELLUM SERPENS (Hassall).

Campanularia serpens HASSALL, Trans. Micro. Soc., III, 1852, p. 163.

Reticularia serpens VERRILL, Checklist, 1879, p. 79.

On *Sertularella polyzonias* from 50 fathoms, Canso Banks.

Genus GRAMMARIA

GRAMMARIA ABIETINA (Sars).

Campanularia abietina SARS, Nyt Mag. for Naturvidensk, bd. 6, 1851, p. 139.

Grammaria robusta STIMPSON, Marine Invert. of Grand Manan, 1854, p. 9.

Grammaria abietina WHITEAVES, Marine Invert. Eastern Can., 1901, p. 28.

Dredged from rocky bottom in 20 fathoms, near the shore in Chedabucto bay, Canso.

Genus LAFŒA.

LAFŒA DUMOSA (Fleming).

Sertularia dumosa FLEMING, Edin. Phil. Jour., II., 1828, p. 83.

Lafœa dumosa NUTTING, Hydroids of Woods Hole, 1901, p. 355.

Lafœa dumosa WHITEAVES, Marine Invert. Eastern Can., 1901, p. 24.

Dredged from rocky bottom in 20 fathoms, Chedabucto bay, Canso.

LAFŒA FRUTICOSA Sars.

Lafœa fruticosa Sars, Norske Hydroider, 1862, p. 30.

Lafœa fruticosa VERRILL, Checklist, 1879, p. 17.

Dredged from rocky bottom in 20 fathoms, Chedabucto bay, Canso.

LAFŒA GRACILLIMA (Alder).

Campanularia gracillima ALDER, Trans. Tynes. Nat. Field Club, 1857, p. 39.

Lafœa gracillima NUTTING, Hydroids of Woods Hole, 1901, p. 356.

Lafœa gracillima WHITEAVES, Marine Invert. Eastern Can., 1901, p. 24.

On rock brought up by trawl hook from 50 fathoms, Canso Banks.

LAFŒA SYMMETRICA Bonnevie.

Lafœa symmetrica BONNEVIE, Den Norske Nordhavs Expedition, 1899, p. 64.

Lafœa symmetrica BILLARD, Exped. Sc. du "Travailleur" et du "Talisman," 1907, p. 176.

Dredged from rocky bottom in 20 fathoms, Chedabucto bay, Canso.

This species has been reported only from Norway by Bonnevie and from Cape Spartel by Billard. Jäderholm makes it synonymous with *Lafœa grandis*,¹ but I think there is not good basis for so doing. Specimens of *L. grandis* found in the Vancouver Island region have much larger hydrothecæ than these from Canso and apparently that is true of the specimens reported from Iceland by Hincks when he gave the original description of *L. grandis*.²

LAFŒA PYGMŒA (Alder).

Lafœa pygmæa HINCKS, British Hydroid Zoophytes, 1868, p. 205.

Hebella pygmæa NUTTING, Hydroids of Woods Hole, 1901, p. 353.

Lafœa pygmæa BROCH, Nordmeer gesammelten Hydroiden, 1903, p. 5.

¹Northern and Arctic Invertebrates, 1909, p. 72.

²Ann. and Mag. Nat. Hist., 4th ser. XIII, 1874, p. 148.

On a bryozoan (*Menipea ternata*) dredged in 25 fathoms in Chedabucto bay, Canso.

This species has been placed in the genus *Hebella* by some authors, but it has no hydrothecal diaphragm and hence cannot be placed there. Since Broch found and described the coppinia mass there is still better evidence that the species should be placed with *Lafæa* rather than with *Hebella* as the gonangia of *Hebella* are not massed.

SERTULARIDÆ.

Genus ABIETINARIA.

ABIETINARIA ABIETINA (Linnæus).

Sertularia abietina LINNÆUS, Systema Naturæ, 1758, p. 808.

Sertularella abietina NUTTING, Hydroids of Woods Hole, 1901, p. 361.

Sertularia abietina WHITEAVES, Marine Invert. Eastern Can., 1901, p. 25.

Abietinaria abietina NUTTING, American Hydroids, Part II, 1904, p. 114.

On rock from 50 fathoms, Canso Banks.

Genus DIPHASIA.

DIPHASIA FALLAX (Johnston).

Sertularia fallax JOHNSTON, British Zoophytes, 1847, p. 73.

Diphasia fallax NUTTING, Hydroids of Woods Hole, 1901, p. 361.

Diphasia fallax WHITEAVES, Marine Invert. Eastern Can., 1901, p. 26.

Diphasia fallax NUTTING, American Hydroids, Part II, 1904, p. 114.

Dredged in 4 fathoms, Barrington Passage.

DIPHASIA ROSACEA (Linnæus).

Sertularia rosacea LINNÆUS, Systema Naturæ, 1758, p. 807.

Diphasia rosacea NUTTING, Hydroids of Woods Hole, 1901, p. 361.

Diphasia rosacea WHITEAVES, Marine Invert. Eastern Can., 1901, p. 26.

Diphasia rosacea NUTTING, Amer. Hydroids, Part II, 1904, p. 107.

Very abundant in the material from Barrington Passage.

Genus HYDRALLMANIA

HYDRALLMANIA FALCATA (Linnæus).

Sertularia falcata LINNÆUS, Systema Naturæ, 1758, p. 810.

Hydrallmania falcata NUTTING, Hydroids of Woods Hole, 1901, p. 364.

Hydrallmania falcata WHITEAVES, Marine Invert. Eastern Can., 1901, p. 27.

Hydrallmania falcata NUTTING, Amer. Hydroids, Part II, 1904, p. 124.

Common in material from Barrington Passage.

Genus SELAGINOPSIS.

SELAGINOPSIS MIRABILIS (Verrill).

Diphasia mirabilis Verrill, Amer. Jour. Sci. and Arts, 1872, p. 9.

Diphasia mirabilis Whiteaves, Marine Invert. Eastern Can., 1901, p. 26.

Selaginopsis mirabilis Nutting, Amer. Hydroids, Part II, 1904, p. 128.

On rock from 50 fathoms, Canso Banks.

Genus SERTULARELLA.

SERTULARELLA CONICA Allman.

Sertularella conica Allman, Hydroids of the Gulf Stream, 1877, p. 21.

Sertularella conica Nutting, Amer. Hydroids, Part II, 1904, p. 79.

Sertularella conica Fraser, West Coast Hydroids, 1911, p. 68.

A few young colonies were found growing on *Sertularella tricuspidata* from an ascidian stalk in 50 fathoms on the Canso Banks.

SERTULARELLA POLYZONIAS (Linnæus).

Sertularella polyzonias Nutting, Amer. Hydroids, Part II, 1904, p. 90.

Sertularia polyzonias Linnæus, Systema Naturæ, 1758, p. 813.

Sertularella polyzonias Nutting, Hydroids of Woods Hole, 1901, p. 362.

Sertularella polyzonias Whiteaves, Marine Invert. Eastern Can., 1901, p. 25.

Dredged in rocky bottom in 10-20 fathoms, Chedabucto bay, Canso.

SERTULARELLA TRICUSPIDATA (Alder).

Sertularia tricuspidata Alder, Ann. and Mag. Nat. Hist., 2nd ser. XVIII, 1856, p. 356.

Sertularella tricuspidata Nutting, Hydroids of Woods Hole, 1901, p. 362.

Sertularella tricuspidata Whiteaves, Marine Invert. Eastern Can., 1901, p. 26.

Sertularella tricuspidata Nutting, Amer. Hydroids, Part II, 1904, p. 71.

Common on rocks and ascidian stems in 50 fathoms, Canso Banks.

Genus SERTULARIA.

SERTULARIA PUMILA Linnæus.

Sertularia pumila Linnæus, Systema Naturæ, 1758, p. 807.

Sertularia pumila Nutting, Hydroids of Woods Hole, 1901, p. 359.

Sertularia pumila Whiteaves, Marine Invert. Eastern Canada, 1901, p. 25.

Sertularia pumila Nutting, Amer. Hydroids, Part II, 1904, p. 51.

Very abundant everywhere, on piles, stones, seaweeds, etc., near the surface of the water, Canso.

Genus THUIARIA.

THUIARIA ARGENTEA (Linnæus).

Sertularia argentea Linnæus, Systema Naturæ, 1758, p. 809.

Thuiaria argentea Nutting, Hydroids of Woods Hole, 1901, p. 363.

Thuiaria argentea Whiteaves, Marine Invert. Eastern Can., 1901, p. 27.

Thuiaria argentea Nutting, Amer. Hydroids, Part II, 1904, p. 71.

Dredged in 5 fathoms, Barrington Passage; on rocks in 50 fathoms, Canso Banks.

THUIARIA LONCHITIS (Ellis and Solander).

Thuiaria lonchitis Nutting, Amer. Hydroids, Part II, 1904, p. 66.

Thuiaria lonchitis E. and S., Nat. Hist. Zoophytes, 1786, p. 42.
On rock from 50 fathoms, Canso Banks.

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1911. The hydroids of the west coast of North America. Bulletin from the laboratories of natural history of the State University of Iowa.

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1852. Description of three species of marine zoophytes. Transactions of the Microscopical Society.

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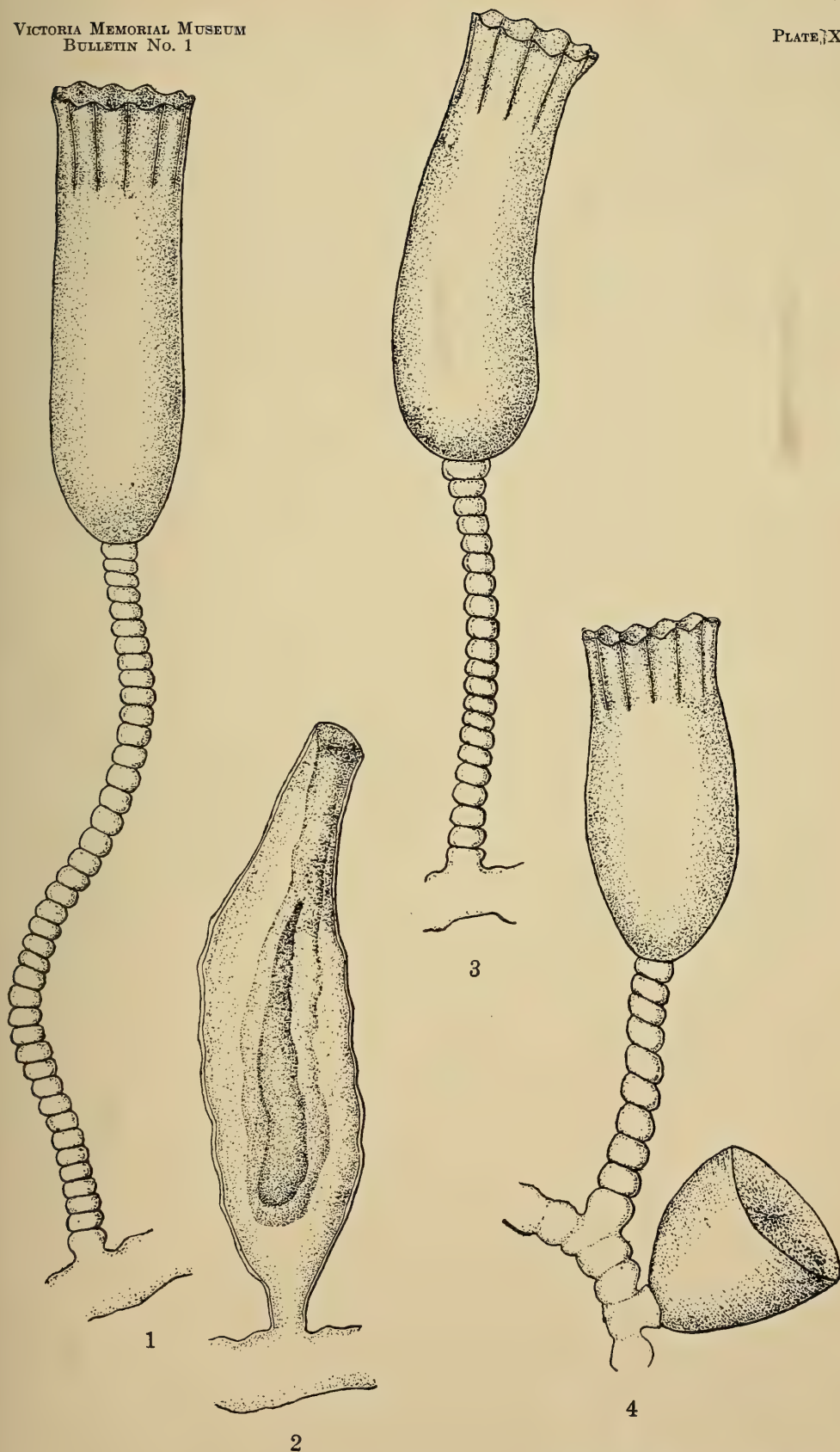
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EXPLANATION OF PLATE XI.

Figs. 1 and 2. *Campanularia magnifica*. Hydrothecae.

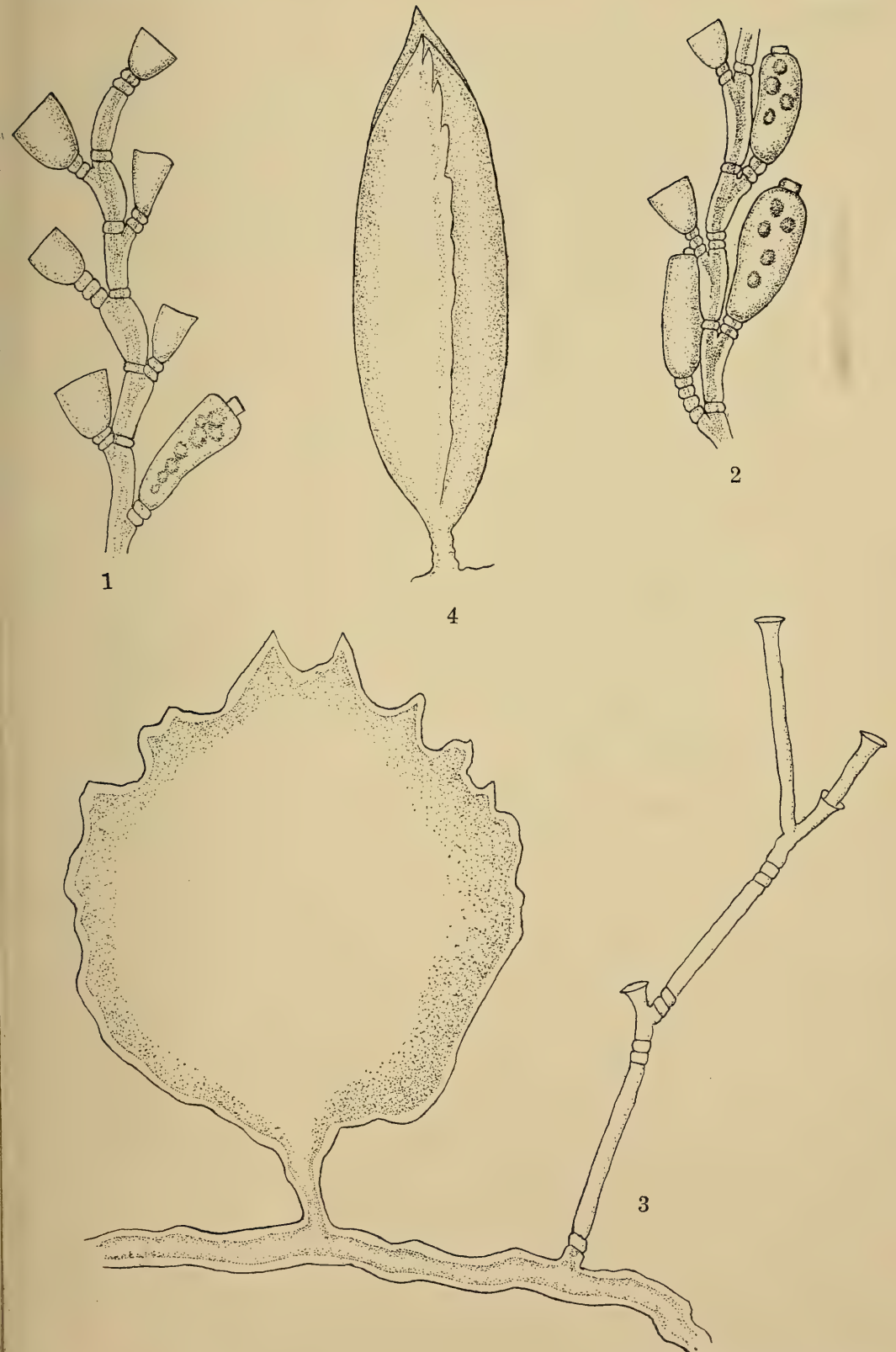
Fig. 3. Gonophore.

" 4. *Campanularia speciosa*. Hydrotheca and gonangium.
Magnification about 20 diameters.



EXPLANATION OF PLATE XII.

Figs. 1 and 2. *Obelia geniculata*. Colony showing abnormal position of the gonangia.
“ 3 and 4. *Halecium minutum*. Portion of colony showing trophosome and gonangium.
Magnification about 20 $\frac{1}{2}$ diameters.

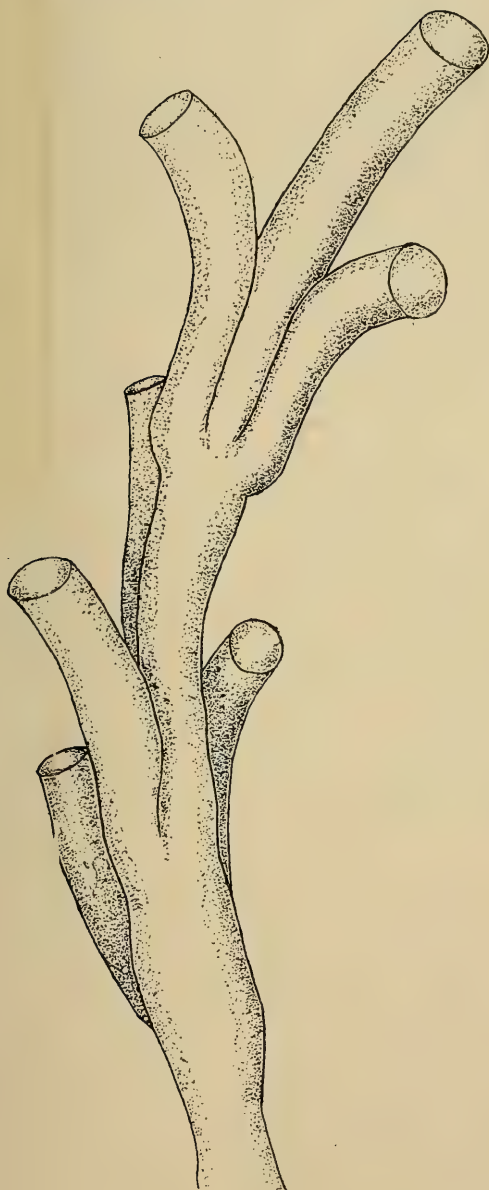


Hydroids of Nova Scotia.

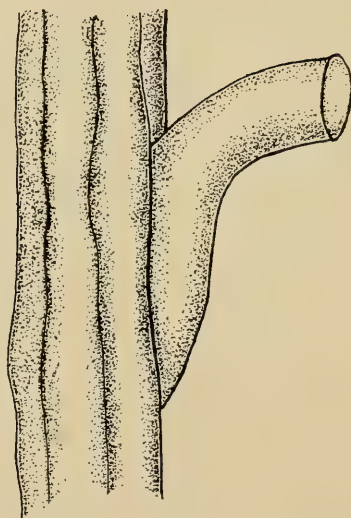
Clara A. Fraser, del. After C. M. F.

EXPLANATION OF PLATE XIII.

- Fig. 1. *Cryptolaria triserialis*. Non-fascicled portion of a branch.
" 2. Portion of main stem.
Magnification about 20 diameters.

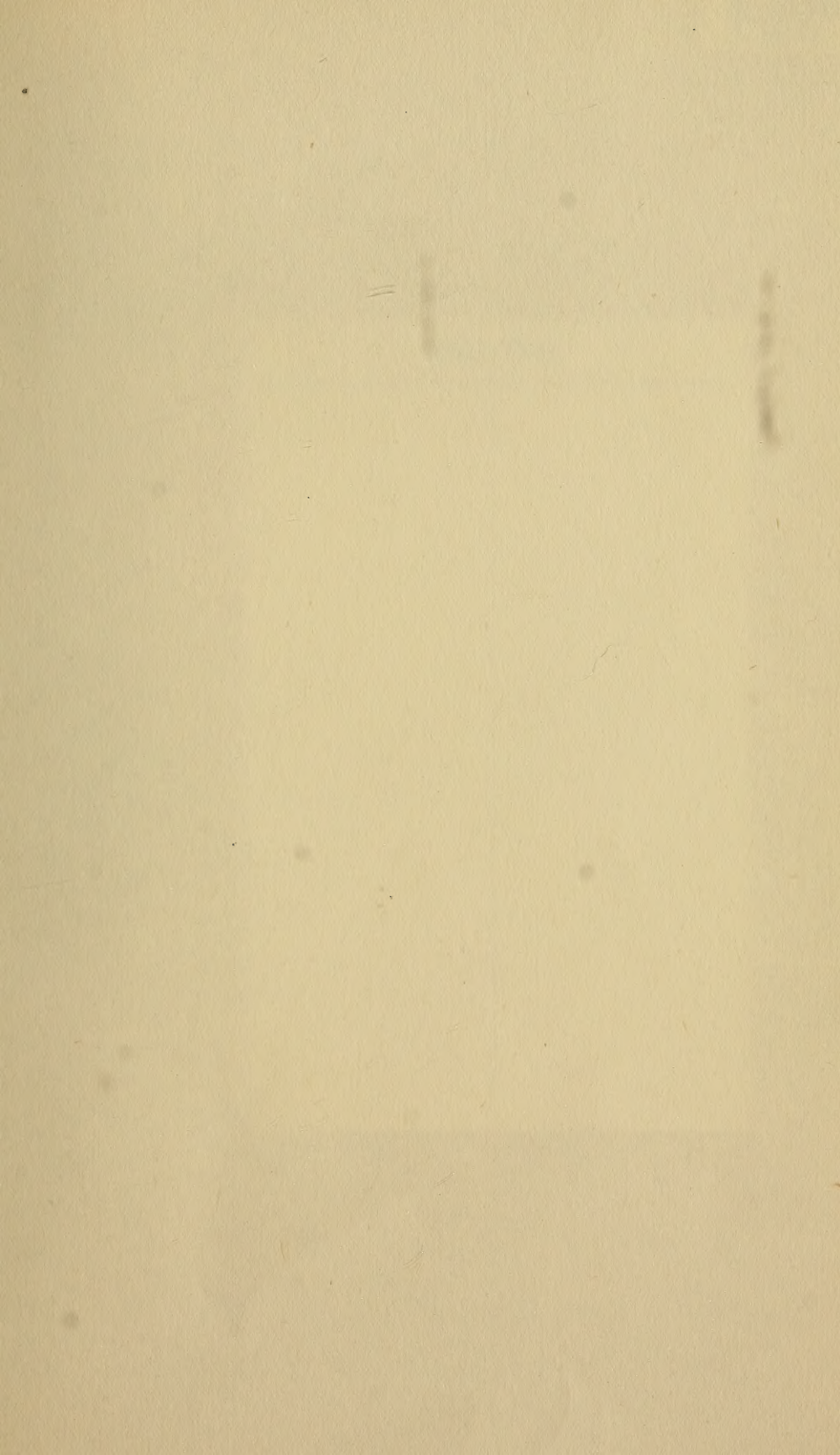


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Clara A. Fraser, del. After C. M. F.
Hydroids of Nova Scotia.



Date Due

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